



SATURN V PROGRAM DIRECTIVE

NUMBER: 34

SUBJECT: SATURN V EMERGENCY DETECTION SYSTEM TEST PROGRAM POLICY AND CONTROL

ORIGINAL ISSUE DATE: August 9, 1966 REVISION NUMBER: _____

DATE OF REVISION: _____ PREPARED BY: SATURN V RELIABILITY & QUALITY OFFICE
PHONE: 876-2870/KEYES (I-V-Q)

I. PURPOSE

This Program Directive establishes the Saturn V Emergency Detection System (EDS) Test Program Policy and Controls.

II. SCOPE

This Program Directive is applicable to all MSFC elements responsible for:

- A. Saturn V EDS component qualification and reliability demonstration testing.
- B. Saturn V EDS breadboard (system development) testing.
- C. Saturn V EDS prelaunch checkout and launch operations.
- D. Saturn V EDS flight testing.
- E. Configuration Management.
- F. Launch Vehicle Mission Directives.
- G. Pre-flight and Flight Readiness Reviews.
- H. Flight Evaluation.

III. REFERENCES

- A. Apollo Test Requirements, NPC 500-10.
- B. Saturn V Program Specifications (SA-501, SA-504, and Addenda).
- C. Saturn Emergency Detection System - Ground Test Program - Operational Plan, R-ASTR, Draft of March 11, 1966.
- D. Apollo Reliability and Quality Assurance Program Plan, NPC 500-5.

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- E. KSC/MSFC Sub-Agreement for Prelaunch Checkout and Launch Operations, December 20, 1965.
- F. Apollo Interface Document 13M65001, Design Criteria for Saturn V On-Board Emergency Detection System (EDS).
- G. The Apollo Interface Document issue effective for each Saturn V Launch Vehicle, for example: Apollo Interface Document 40M37533, Description of Saturn SA-501 and Apollo SC-017 Emergency Detection System.
- H. Apollo Configuration Management Manual NPC 500-1.
- I. Procedure for Certification of Flight Worthiness I-IB/V-TD No. 100, March 16, 1966.
- J. Saturn V Procedure for Pre-Flight and Flight Readiness Reviews, I-V-TD No. 10, April 27, 1966.
- K. Saturn Configuration Management Manual, CM-002-001-2H, January 1, 1966.

IV. POLICY

A. Qualification and Reliability Demonstration Testing

- 1. Qualification and reliability demonstration tests shall be performed on all the Saturn V Components which perform an identifiable EDS function. The testing shall be in accordance with applicable contents of reference III. A., "Apollo Test Requirements, NPC 500-10" and reference III. B., "Saturn Program Specification (SA-501, SA-504 and addenda)" paragraph 3.1.3.8.3 and/or the Saturn V Stage Component Test Program. The identification and control of Saturn V EDS components shall be in accord with applicable contents of reference III. H., "Apollo Configuration Management Manual, NPC 500-1."
- a. General - Testing, both qualification and reliability demonstration of the Saturn V Emergency Detection System components shall be the responsibility of the Saturn V Stage Contractors, except on GFE which is the responsibility of the MSFC design laboratory, R-ASTR. This includes the requirements for design specifications, test specifications, test procedures, test reports and test certification. The tests shall be performed in accord with applicable contents of reference III. A. and reference III. B. of this directive.

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- b. Special Testing - Special testing of a selected group of the most critical Saturn V EDS components shall be performed for qualification and reliability demonstration to supplement the Saturn V stage contractors test program, as described in reference III. C., "Saturn Emergency Detection System Ground Test Program Operational Plan," Draft, R-ASTR, March 11, 1966.
 - c. Qualification and Reliability Test Certification - Certification of the Saturn V EDS components shall be performed jointly by the stage contractor and MSFC design laboratory (R-ASTR) and certified in support of R-QUAL representative sign-off of applicable content of reference III. I., "Procedure for Certification of Flight Worthiness I-IB/V-TD No. 100," March 16, 1966.
- B. Saturn V EDS Breadboard (System Development) Testing -
- The Saturn V EDS breadboard (system development) testing shall be accomplished through the establishment of a Saturn V EDS breadboard facility. In general the facility will have the capability of providing a complete electrical simulation of the EDS for Saturn V launch vehicle, including the necessary electrical support equipment and simulated EDS Apollo Panels. The plan shall basically conform to the provision described in reference III. C., "Saturn Emergency Detection System Ground Test Program Operational Plan," Draft, R-ASTR, March 11, 1966.
- C. Saturn V EDS Prelaunch Checkout
- The first system-level checkout of each set of EDS flight hardware will be performed during prelaunch checkout at KSC after space vehicle assembly, in accordance with the provisions of reference III. E., "KSC/MSFC Sub-Agreement for Prelaunch Checkout and Launch Operations, Dec. 20, 1965."
- D. Saturn V Flight Test Program
- The EDS shall be flight tested in open-loop and then in closed-loop configuration on unmanned flights before operating closed-loop on manned flights in accordance with Section 2.0 of the specific "Launch Vehicle Mission Directive."

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PHONE: 876-2870/KEYES (I-V-Q)V. RESPONSIBILITIES AND PROCEDURESA. Saturn V EDS Component Test and Breadboard Development Program

1. The Crew Safety Panel shall be responsible for:

- Crew safety for the Apollo/Saturn Program.
- Establishing EDS design criteria.
- Coordinated review and approval with I-V-E* of EDS components for Part I, CEI Specification.
- Recommended list of EDS components for the MSFC Special Test Program.
- Coordinated requirements with I-V-T* on flight mission assignments for EDS.
- Report on EDS flight mission objectives.
- Technical control of changes to EDS through appropriate CCB.

2. The Electrical Panel; Emergency Detection System Sub-Panel Co-Chairman shall be responsible for:

- Design of EDS network circuits, checkout circuits, and procedure.
- EDS breadboard facility
 - Design direction
 - Operation
 - Maintenance
 - Testing
 - Coordinating the EDS breadboard requirements within MSFC.

* See Addendum - responsible MSFC, EDS Points of Contact
(Enclosure 1)

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3. The R-ASTR shall be responsible for:
 - Technical support on the stage contractors EDS test program.
 - EDS component qualification certification.
 - EDS component qualification and reliability demonstration on G.F.E.
 - EDS system development.
 - Designating an EDS Test Coordinator* who shall be responsible for:
 - Technical supervision of the EDS Test Contractor for the EDS special test, qualification, and reliability demonstration testing.
 - Final approval of the EDS special test specifications and procedures.
 - Coordinating the EDS special test program within MSFC.
4. The Saturn V Reliability and Quality Office, I-V-Q, shall be responsible for:
 - EDS coordinator for the Saturn V Program Manager.*
5. The Stage Contractor shall be responsible for:
 - Qualification and reliability demonstration testing of EDS components identified in the stage Part I CEI Specification.
 - Maintaining Configuration Management Controls on the EDS components, system and stage.
 - Certification of EDS components for each flight stage.
 - Providing MSFC management reviews on flight readiness of EDS.

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6. The EDS Testing Contractor for MSFC Special Testing shall be responsible for:

- Qualification and reliability demonstration testing of the selected EDS components.
- Preparation of:
 - Specifications.
 - Procedures.
 - Final Test Report.
 - Flash Failure Reports.
 - Monthly Progress Reports.
- Conduction of Testing including -
 - Performance.
 - Scheduling.

7. The EDS Breadboard Facility Contractor shall be responsible for:

- EDS Breadboard design; fabrication, and checkout.

8. R-QUAL shall be responsible for:

- Coordination of Stage Contractors EDS component certification to R-ASTR.
- Sign-off of COFW for EDS components.
- Identification of EDS Reliability Coordinator*
 - Reliability analysis of EDS test results.
 - Reliability assessment of EDS

* See Addendum - responsible MSFC, EDS Points of Contact
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PHONE: 876-2870/KEYES (I-V-Q)B. Saturn V EDS Prelaunch Checkout and Launch Operations

The Saturn V EDS test and checkout requirements, specifications and criteria for prelaunch checkout and launch operations at KSC shall be supplied by MSFC for each mission in accordance with reference III. E., "KSC/MSFC Sub-Agreement for Prelaunch Checkout and Launch Operations." Based upon these requirements, specifications, and criteria, KSC will prepare EDS test and checkout procedures for each mission. (It is recognized that inputs by all three centers: MSFC, MSC, and KSC will be coordinated through the intercenters Electrical Panel, Emergency Detection System Sub-Panel for the Apollo/Saturn V EDS prelaunch and launch test and checkout operations.) I-V-T is responsible for coordination of the prelaunch and launch test and checkout operation on the Saturn V Launch Vehicle. *

C. Saturn V EDS Flight Test Program

Responsibilities and procedures for the flight testing of the Saturn V portion of the Apollo-Saturn V EDS are cited in the Launch Vehicle Mission Directives issued by MSFC for each mission. These directives promulgate the launch vehicle objectives for each mission, and identify MSFC requirements for the conduct of the mission. (Spacecraft flight test objectives and requirements are included in corresponding MSC Mission Directives. These are consolidated with MSFC objectives and requirements in covering MSF mission directives.) I-V-T is responsible for "Launch Vehicle Mission Directives."*

D. Saturn V EDS Flight Evaluation

Responsibilities and procedures for the flight evaluation of the Saturn V portion of the Apollo-Saturn V EDS are the Saturn V Flight Evaluation Working Group.* The reports and evaluation for each of the Launch Vehicle Flights based on flight mission objectives is covered in the "Result of the Saturn V Launch Vehicle Test Flight."



Arthur Rudolph
Manager, Saturn V Program

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R-ASTR-BP, Mr. White
R-AERO-F, Mr. Lindberg
R-QUAL-RA, Mr. Butler
I-MO-MGR, Dr. Speer

ENCLOSURE I TO SATURN V EMERGENCY DETECTION SYSTEM
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ADDENDUM
EDS POINTS OF CONTACT

<u>MSFC ORGANIZATION</u>	<u>RESPONSIBILITY</u>	<u>NAME</u>	<u>PHONE NUMBER</u>
R-ASTR-EA	MSFC Co-Chairman of Crew Safety Panel	Mr. R. G. Smith	876-2567
R-ASTR-EA	MSFC Co-Chairman of EDS Sub-Panel of the Electrical Panel	Mr. W. G. Shield	876-5327
R-ASTR-EA	Flight Evaluation	Mr. J. W. Vann	876-4927
R-ASTR-BP	EDS Test Coordinator	Mr. W. T. White	876-8311
R-QUAL-RA	EDS Reliability Coordinator	Mr. George Butler	876-3583
R-AERO-F	Saturn V Flight Evaluation Working Group	Mr. J. P. Lindberg	876-4575
I-V-Q	EDS Coordinator for Saturn V Program Manager	Mr. P. F. Keyes	876-2870
I-V-E	EDS Components for Part I, CEI Specification	Mr. A. A. Conway	876-3629
I-V-T	EDS Coordinator for Flight Mission Assignments	Mr. R. E. Dunbar	876-6556
I-V-T	EDS Coordinator for Prelaunch Checkout and Launch Operations	Mr. R. E. Dunbar	876-6556
I-V-T	Launch Vehicle Mission Directives	Mr. R. E. Dunbar	876-6556

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